DMR DIGITAL MOBILE RADIO

KB4FHP

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CHARMS
CHERRY
CHARMS
CHARMS
GRAPE

Amateur radio with a different flavor.....

Digital Mobile Radio quick comparison

DMR radio operates in three distinct modes.

Tier 1 or Type 1

Tier 1 (Europe only 146Mhz less than .5 watts and no repeater use) It is the specific equivalent of FSR in the US. Not used in USA.

Tier II- Mototrbo most common format. Used in Business, Public Safety, and Ham radio currently. More on this later....

Other than conventional *two way* what mode or format has the most licenses in ARRL'S WCF, Florida?

1) P25 trunked or conventional.

(2) NXDN or IDAS trunked or conventional

(3) DMR trunked or conventional

(4) EDAC Pro-voice or trunked

DMR IS THE MOST USED FORMAT

DMR (COMMERCIAL OR PS)

- 4328 FREQUENCIES

NXDN OR P25 (COMM OR PUB SFTY)

- NXDN 922
- P25 INCL EDAC 2042

Tier III-- Mototrbo (or similar format) trunked multi site and linked multi site with data, text, voice, and voice over data. NOT CURRNETLY USED IN AMATUER.

NOW WHAT THE HECK IS DMR?

Digital Mobile Radio DMR

- DMR — the simple short answer; originally the alternative to multi site connected Trunking in Europe. To more effectively use conventional frequencies increasing the available spectrum functionality on existing tower and antenna sites.
- Moved into the US for the same purpose in areas that could not build complex Trunking or multi site radio systems. It also complied with the mandatory narrow band and temporally made scanners ineffective on the format.
- Motorola engineers built the first systems on Ham as experiment and out of surplus equipment.

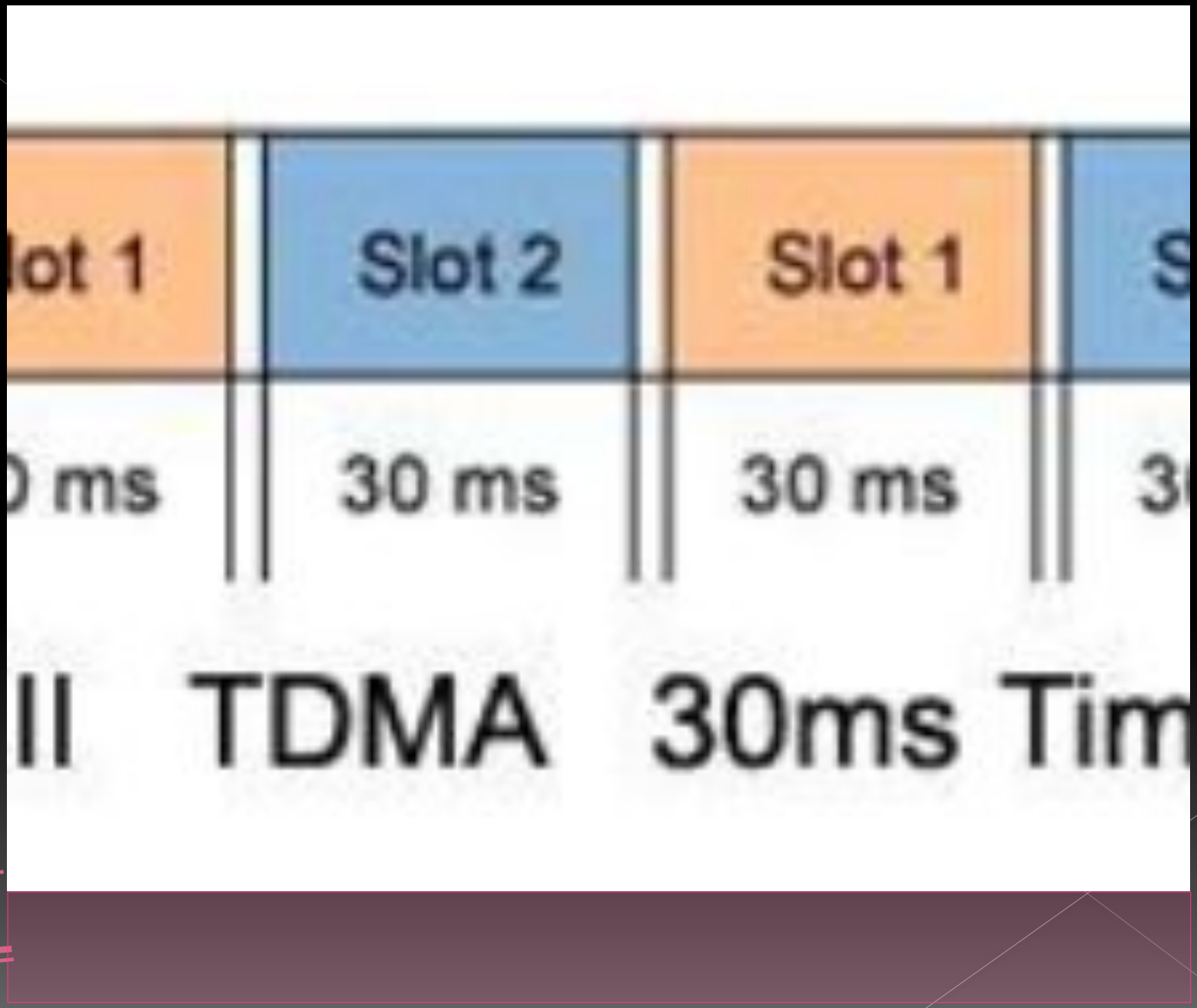
T-time
D-division
M-multi
A-access

- Take a **narrow** band frequency on ham 2m, 70cm, or 900 Mhz.
- Every 30 milliseconds the radio will switch from one side of the channel to the other allowing for two complete conversations on two talk groups at the same time.
- WOW! lets break this down a minute with an example

T.D.M.A.

That is like living in a duplex apartment.... you're in the same building essentially but , within reason, normal conversations in the duplex left side are not heard or have any relation to the conversation duplex's right side; nor are they heard by each other.

The 12.5khz frequency is divided into two channels this is the ***Time Slot***.



TOLLSEMIT

This information at the repeater is then coupled with a ***c-bridge*** to establish a network with the internet or other linking modes to other repeaters.

OK new term what is a ***talk group?***

There are talk groups on each repeater. Depending on what the owner /operator wants to provide. The amount of talk groups can range from a few per ***Time Slot*** to a plethora of available groups. To simplify this think of it as a group of CTCSS tones on the same repeater. This, by the way is similar how community commercial repeaters work.

They essentially share the frequency with many users of in a group.

They essentially share the frequency with many users of in a group.

Some talk groups are ***full time*** some are ***PTT.***

Full time--- these are available for use anytime and can be monitored for use much in the same way our analog repeater is monitored. Some of the more popular in this area is ***Local 2 and Local 9. aka Static Talk groups***

PTT

TALK GROUPS

.

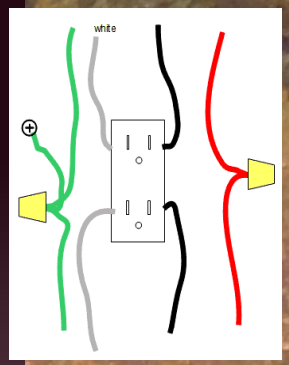
PTT talk groups... here's the one that gets HAM operators all worked up.

Aka; Dynamic Talk Group

These are *timed* use **talk groups**. If you are on Tac 310, a worldwide talk group, and you hear no one. You must "kerchunk the repeater", no call sign just PTT to open the slot. Most of the time, unless the slot is open and you did not hear it the slot does not transmit your signal it only opens the timeslot for 15 minutes or however long the slot is slated for.

Well, if that's not enough there still more.....

LET'S TALK CODE PLUG……



Information. These are codes In order for your DMR radio to work it has to have a code plug. The term refers to an information or programming data script that includes several pieces of necessary information. It provides that radio with freq, ts, power, and ***Talk Group*** we discussed earlier. Currently in the **US/WW** there are over 6000 talk groups. (not all available to every RPTR.) Some are common to most RPTR like TAC 310, 311 and 312; others are regional like 3112 Florida SW and 3124 SE region.

The code plug also allows you to build zones, scan list, data base csv files for contacts and most important it has your ***DMR ID!*** currently worldwide there are 300,000 users for DMR. Each has an individual DMR ID that you obtain from *https://www.radioid.net*.

This is one of the ways to assure licensed amateur operators are on the ham frequencies. The code plug also is sharable to other same radio (model) users. Change the call sign and the DMR ID then copy it to another radio. Most code plugs are convertible from model to model but may not be direct. Many code plugs are very large and complex. Mine has over 1000 frequencies and 100,000 (min) user contacts with 200, or more, talk group id's.

JUANITA AT DINER

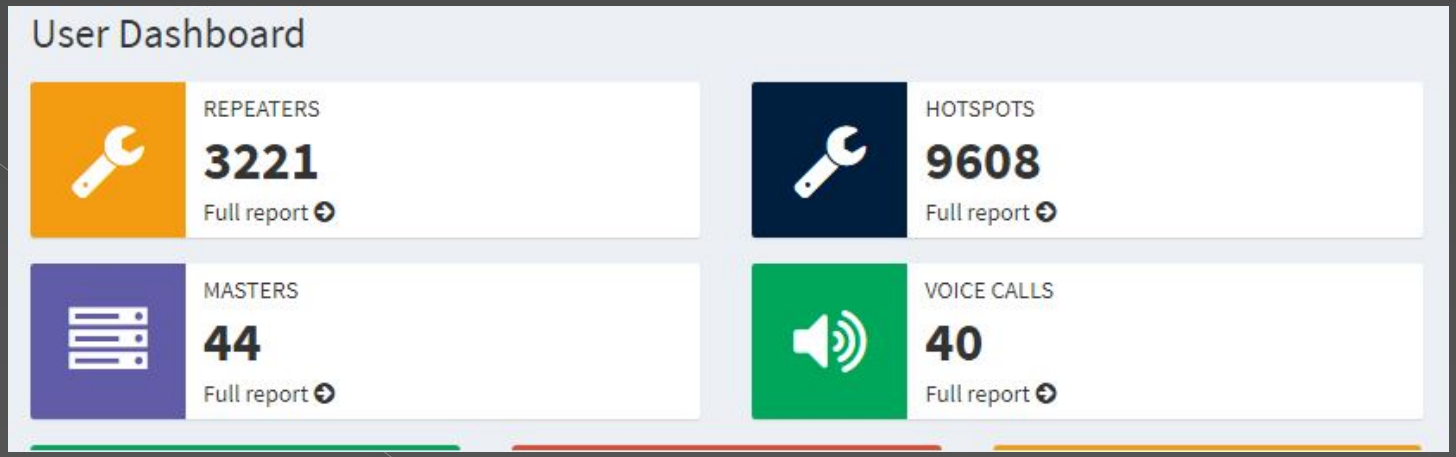
"We are now approaching information overload status for a 20 minute DMR basic intro."

"

Here are a few pieces of information about your local DMR availability, and radio manufactures

Hoseline information and data

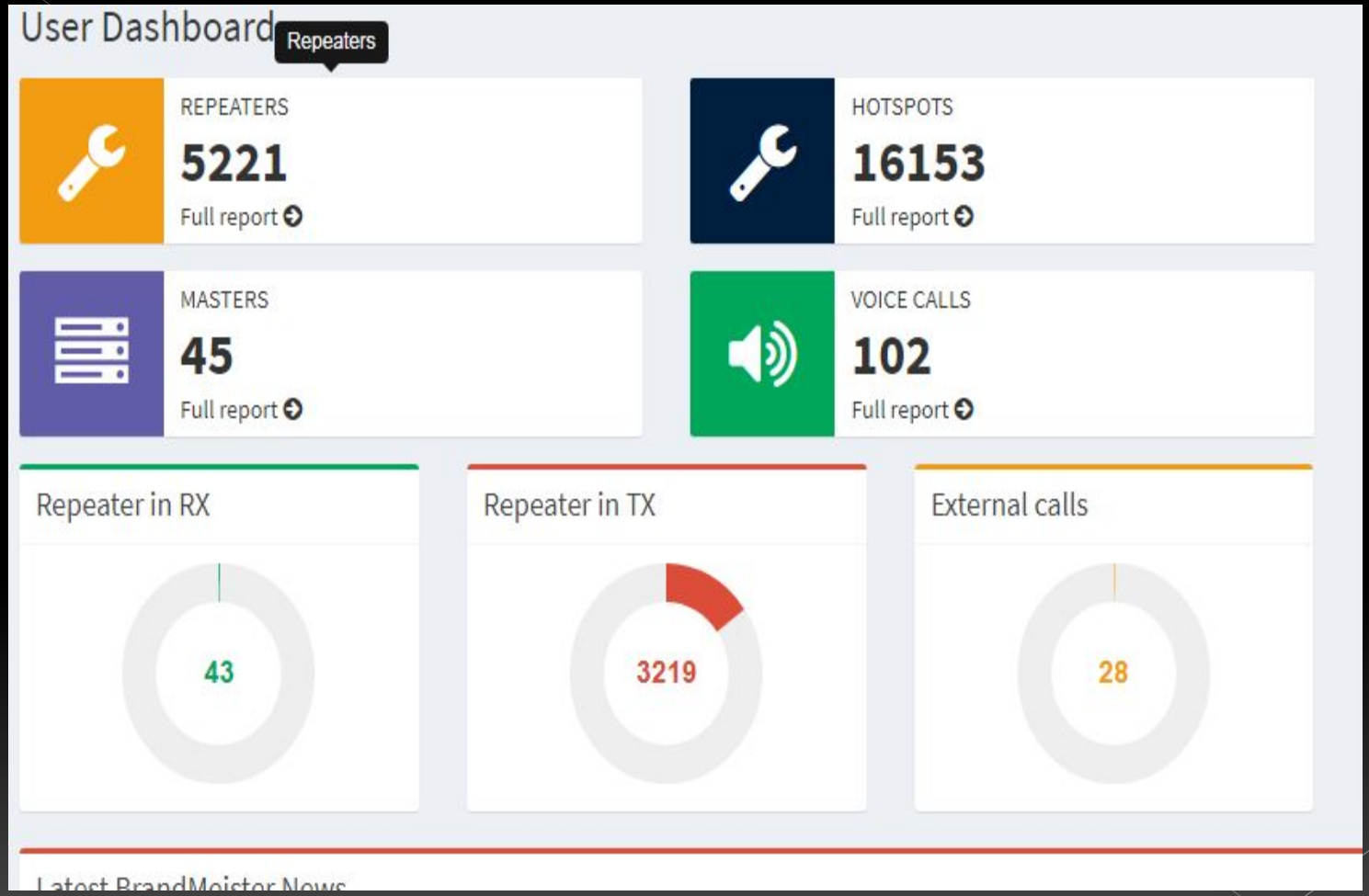
Brandmiester



K4USD

15:52:02.171 Apr 1	1.0	BM3102 -- 393102	DL3OM - Harald - DEU -- Earth -- 2633402	BM-WW CC	0.000	BM-US-3102	Not avail.
15:51:59.357 Apr 1	0.0	K1GAS - Hingham Massachusetts USA -- 312514	W1JGR - John - Pembroke Massachusetts USA -- Earth -- 3125500	DMR-MARC NA CC	-122.5	DMR-MARC-CC1	0.0%
15:51:57.348 Apr 1	0.0	K1GAS - Hingham Massachusetts USA -- 312514	W1JGR - John - Pembroke Massachusetts USA -- Earth -- 3125500	DMR-MARC NA CC	-127.8	DMR-MARC-CC1	25.0%
15:51:55.819 Apr 1	1.0	W4VCO - Lakeland Florida USA -- 311257	KB4FHP - Joseph - Lake Wales FL USA -- Earth -- 3157784	TAC311 49-98	-123.1	K4USD Network	7.4%
15:51:53.051 Apr 1	1.0	KJ4OVA - Orlando Florida USA -- 311214	WA4OHV - Thomas - Winter Springs FL USA -- Earth -- 3130932	TAC310 CC	-106.8	DMRX-P	0.0%
15:51:47.230 Apr 1	0.0	TGIF Link - 31025701	N5OGD - Gerald - Abilene Texas USA -- Earth -- 3148922	TGIF 14-28	N/A	K4USD Network	0.0%
15:51:42.280 Apr 1	1.0	WB9COW - Burlington Wisconsin USA -- 315506	KD9KHI - Gary - Burlington Wisconsin USA -- Earth -- 3131981	Bridge CC	0.000	DMRX-P	0.0%
15:51:41.997 Apr 1	0.0	K2HR - Briarcliff Manor New York USA -- 313627	W2PDX - Craig - Yorktown New York USA -- Earth -- 1136159	Bronx-Public CC	-126.9	Bronx-TRBO	0.0%
15:49:57.457 Apr 1	93.0	BM3102 -- 393102	KK4DNL - Clayton - Commerce GA USA -- Earth -- 3127993	ATL Metro CC	0.000	BM-US-3102	0.0%
15:51:21.496 Apr 1	0.0	BM3102 -- 393102	VR2XNG - Dawood - Quarry Bay Hong Kong CHN -- Earth -- 4540284	BM-WW CC	0.000	BM-US-3102	0.0%
15:51:14.881 Apr 1	2.0	BM3102 -- 393102	MI0IKF - John - GBR -- Earth -- 2355037	BM-WW CC	0.000	BM-US-3102	0.0%
15:50:53.015 Apr 1	13.0	N2JTI - Orangeburg New York USA -- 313603	KC2CWT - Robert - Carmel New York USA -- Earth -- 3136109	Tri-State CC	-58.0	NJ-TRBO	0.0%
15:50:58.785 Apr 1	3.0	WD5DBB - Arlington Texas USA -- 314857	KI5CDG - Charles - Burleson Texas USA -- Earth -- 3129990	TXstate CC	-93.6	LonestarNet	0.0%
15:50:57.278 Apr 1	5.0	W4MCO - Orlando Florida USA -- 111201	WA4OHV - Thomas - Winter Springs FL USA -- Earth -- 3130932	TAC310 CC	0.000	DMRX-P	5.3%
15:50:44.533 Apr 1	8.0	N2JTI - Orangeburg New York USA -- 313603	KC2CWT - Robert - Carmel New York USA -- Earth -- 3136109	Tri-State CC	-57.9	NJ-TRBO	0.2%
15:50:48.633 Apr 1	1.0	BM3102 -- 393102	HA3BT - Tibor - HUN -- Earth -- 2163049	BM-WW CC	0.000	BM-US-3102	0.0%
15:50:44.734 Apr 1	0.0	BM3102 -- 393102	W5KLF - Keith - Pineville Louisiana USA -- Earth -- 3135270	Bridge CC	0.000	DMRX-P	Not avail.
15:50:23.950 Apr 1	22.0	BM3102 -- 393102	N0VZC - Mike - St Bonifacius Minnesota USA -- Earth -- 3127009	Handi-Hams CC	0.000	BM-US-3102	0.0%
15:50:41.483 Apr 1	2.0	N0VZC - Eden Prairie Minnesota USA -- 312725	KC5SAM - Virginia - Frontenac Minnesota USA -- Earth -- 3127247	MNstate CC	-103.5	MNDMR	8.0%
15:50:13.700 Apr 1	25.0	HotSpot or Unknown -- 1	W4ITG - Mark - Somerset New Jersey USA -- Earth -- 3134239	Tri-State CC	0.000	NJ-TRBO	0.0%
15:50:27.584 Apr 1	0.0	BM3102 -- 393102	WK0I - John - Porter Ranch CA USA -- Earth -- 3128859	TAC310 CC	0.000	DMRX-P	0.0%
15:50:27.555 Apr 1	0.0	TGIF Link - 31025701	NE5L - Johnnie - Ellisville Mississippi USA -- Earth -- 3128087	TGIF 14-28	N/A	K4USD Network	0.0%
15:50:13.525 Apr 1	1.0	BM3102 -- 393102	KG7GUO - Rick - Port Angeles Washington USA -- Earth -- 3153194	TAC310 CC	0.000	DMRX-P	0.0%
15:50:11.558 Apr 1	1.0	BM3102 -- 393102	PY2WZR - PAULO - Mogi das Cruzes Sao Paulo BRA -- Earth -- 7240573	TAC310 CC	0.000	DMRX-P	0.0%
15:50:04.340 Apr 1	1.0	N2JTI - Orangeburg New York USA -- 313603	KC2CWT - Robert - Carmel New York USA -- Earth -- 3136109	Tri-State CC	-59.0	NJ-TRBO	0.0%
15:50:02.901 Apr 1	1.0	W3ND - Harrisburg Pennsylvania USA -- 314217	K3NYJ - Patrick - New Cumberland Pennsylvania USA -- Earth -- 3115601	TAC310 CC	-120.3	DMRX-P	0.0%
15:49:52.776 Apr 1	1.0	W3BXW - Fairless Hills Pennsylvania USA -- 314203	KC3FIS - Dan - Fairless Hills Pennsylvania USA -- Earth -- 3110593	Tri-State CC	-65.2	NJ-TRBO	0.0%
15:48:15.343 Apr 1	96.0	K4WCL - HotSpot	K4WCL - John - Cumming GA USA -- Earth -- 3113502	ATL Metro CC	0.000	BM-US-3102	0.0%
15:49:39.297 Apr 1	9.0	KB2RF - Howell New Jersey USA -- 313408	WB2HHH - Paul - Brick New Jersey USA -- Earth -- 3134188	Tri-State CC	-96.4	NJ-TRBO	0.0%
15:49:34.305 Apr 1	0.0	W4MCO - Orlando Florida USA -- 111201	WA4OHV - Thomas - Winter Springs FL USA -- Earth -- 3130932	TAC310 CC	0.000	DMRX-P	0.0%
15:49:31.002 Apr 1	1.0	W3BXW - Fairless Hills Pennsylvania USA -- 314203	KC3FIS - Dan - Fairless Hills Pennsylvania USA -- Earth -- 3110593	Tri-State CC	-65.1	NJ-TRBO	0.0%
15:49:29.793 Apr 1	1.0	KB9YVN - Peoria Illinois USA -- 311777	KD9LQL - Kenneth - Morton Illinois USA -- Earth -- 3135532	TAC310 CC	0.000	DMRX-P	0.0%
15:49:26.095 Apr 1	1.0	KB2RF - Howell New Jersey USA -- 313408	WB2HHH - Paul - Brick New Jersey USA -- Earth -- 3134188	Tri-State CC	-98.9	NJ-TRBO	0.0%
15:49:20.260 Apr 1	2.0	W3BXW - Fairless Hills Pennsylvania USA -- 314203	KC3FIS - Dan - Fairless Hills Pennsylvania USA -- Earth -- 3110593	Tri-State CC	-61.9	NJ-TRBO	0.0%
15:49:14.877 Apr 1	1.0	KB2RF - Howell New Jersey USA -- 313408	WB2HHH - Paul - Brick New Jersey USA -- Earth -- 3134188	Tri-State CC	-98.0	NJ-TRBO	0.0%

B MSTR NETWORK

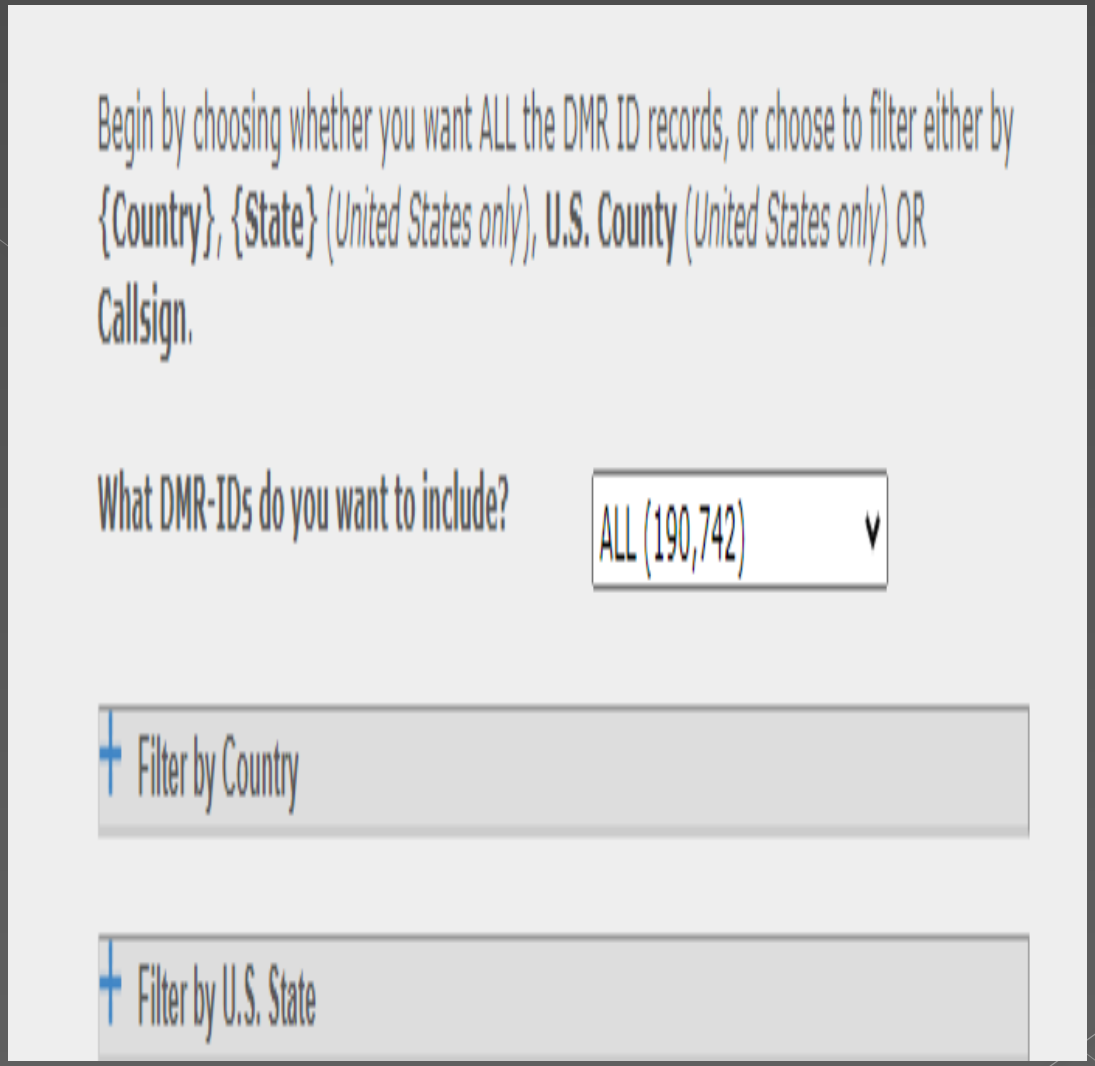


AS OF THISMORNING

DMR ID

DMR ID

- DMR ID'S AS OF 0227 2021



High end= Motorola 6550 **5550 and similar, Vertex Standard, Hytera these are commercial radios that require very specific software**

Middle = Anytone 868 and 878, Connect Systems CS750 (not dual band) and, Aliunce HD1, Alinco, TYT UV380-390 series dual band. $130-$289

Middle = TYT MD380 MD 390 , Most popular DMR radios in use. Note: these are single band so be very specific about what you buy. B-Tech and several others these are usually at or under 100 each

Low-middle Baofeng RD5R DMR version- Make sure this is Tier II excepted; some earlier models were not. These are $50-$79 usually, but obviously limited.

MY INFO SCREEN

This what you would see if I had a QSO with you on DMR on your radio

FAQ= do I have to ID?

Answer: YES FCC rules

One last DMR item... Hot spots. This is another talk but a brief sample....

Hot spots allow you to talk all over the word via the small inexpensive computer interface. These are Wi-Fi devices that actually mimic the repeater.

They receive the low power RF tx from your radio , interface to the computer then once another repeater or Wi-Fi interface is connected it talks to the radio on the other end, anywhere in the world. This allows you to use your DMR, Fusion or Dstar traveling in the car on trips and in areas outside the repeater coverage. This also can bridge some of the other formats together allowing a QSO between Fusion and DMR for example.

Digital Comparison

The question always has been; who will win out as the ‘best’ digital format.

All digital formats use VOCODER

- A vocoder is basically voice compression
- Invented in the mid 1920's
- Used in several media formats and
- Two way radio and Ham radio
- Original slowest by today standard was P25 (not TDMA1 or 2)
- Most vocoder format are similar in speed

Comparision

- Dstar is ICOM and Kenwood authorized
- Requires specific radio from these two manufactures.
- True HAM only no commercial variants.
- Pros; Very reliable clear contact, the only mode that can be direct to ham to ham via multiple repeaters.
- Cons; Cost variables due to limited manufactures

DSTAR CAN BE CROSS MODE VIA HOT SPOT

Dstar in WCF

Limited information notice:

As far As I can tell 7 Dstar repeaters 6 are gateway with 1 (non non-gateway) having ARRL or ARES connection

Great format clear signal

Hopefully can be developed more for Disaster use in the future.

Note: Dstar can and is used readily on HF making this very plausible for disaster communications

COMPARISON

Yaesu Fusion

Pros: great voice communications .

Wide voice is very very clear.

Cons; brand specific to Yaesu , model specific.

Limited connected networks locally WCF

Only one maybe two repeaters in the area have Wires connected .

Disclaimer; information may not include all current operating Fusion Repeaters

COMPARISON

P25 common interface

7 repeaters in WCF*

None are currently linked or on gateway.

Pros;

Great voice quality. Available in 900Mhz band HAM as well.

Cons:

Commercial models only no ham specific models to my knowledge.

Can be bridged to other formats via Hot Spot configuration

*information may not include all available repeaters

Manufactures of P25

Motorola, Harris, Icom, EF Johnson, Kenwood, Tait, Yaesu (commercial)

others may be available not listed

None are Ham specific. Models are used that are band approved may be limited and have certain functions like FPP blocked out of Ham Bands

note; Currently the CAP uses P25

COMPARISON

NXDN

Manufacture specific mode.

ICOM (IDAS) and Kenwood (NXDN)

VERY VERY good voice quality.

PROS; WCF area has extensive well maintained linked NXDN net work associated with West Florida Group INC. 5 repeaters

Conducts nets and is linked to weather station in Ruskin.

Can be accessed via bridge from Hot Spots from other modes.

Cons: Limited to single band commercial eq.

REMEMBER I SAID THE PREDOMINANT MODE IN COMMERCIAL?

It is the same with HAM

Currently there are a least (some I'm sure I don't have listed)

TWENTY TWO DMR REPEATERS IN OPRATION IN WCF

ALL HAVING AT LEAST ONE OR MORE COMMON TALK GROUPS.

AND MORE ON THE WAY

DOES THIS MEAN DMR HAS WON OUT?

NO

DMR

FLAVOR FLAVOR FLAVOR

I am sure you have questions or comments but let me talk about the title 'a different flavor'
I'll explain.

Amateur radio

How does it fit into HAM

Leadership

New HAMS

HF

I'm sure you've heard this before…

Your one of those?

That's not really Ham radio….

Waiting to see who comes out on top…..

DMR

DIGITAL MOBILE RADIO ASSOCIATION

PAUSE TO EXPLAIN

Will it ever have a place in disaster communications?

SHORT ANSWER: YES

SEVERAL LINK SYSTEMS ALREADY IN CENTRAL FLORIDA

It will take open minded innovation to adapt.
First HAM have to realize the potential; then embrace the innovation for the betterment and enhancement of the publics safety.

compatability

Stardard 2m/70cm

- In MOST deployable temp communications systems a ‘patch or bridge’ of some type can blend 2m conventional or a site repeater into select PS systems.

Digital modes

- Digital, especially DMR and P25 can not only be patched several talk groups can be bridged to specific PS talk groups. Example- bridge FL ARES into the command post for state wide coordination. Or site specific TG into field comms like damage assessment from ARES to CP

COMPATABILITY

SITE-DMR TO DSTAR

- THE MOST MODERN EQUIPMENT FOR BRIDGE CAN BRIDGE VIRTUALLY ANYTHING TO ANYTHING.
- SOME HOT SPOT ON THE HORIZON WILL PATCH EASIER THAN. AND ITS PRETTY EASY NOW.

CURENT BRIDGES IN WCF

- THERE ARE SEVERAL BRIDGE TALK GROUPS IN WCF SECTION. (CURRENTLY DMR)
- POLK HAS NOW BRIDGE TG FOR ALL OF POLK AND LAKE COUNTIES (CURRENTLY DMR)
- POLK HAS BRIDGED TG WITH FDARN
- OTHERS ARE INQUIRING

MOBILE BASE ANTENNA FOR DIGITAL

I GET THIS QUESTION ABOUT ONCE A WEEK

WHAT'S THE BEST DIGITAL ANTENNA FOR MY NEW DMR?

CLARIFICATION QUESTION

ARE YOU SURE I DON'T HAVE TO HAVE A DIGITAL ANTENNA?

math question.....

_____ enter last 2 digits of your birth year ie 45 for 1945

_____ age you will be this year if you have had a bday or not yet ie 33

add the two numbers together here and I will explain at the end.

All different

119 we're all the same

Thank You !!!!!!!!!

73

Mike KB4FHP

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BIBLIOGRAPHY/ statement

Moto turbo reg trade mark Motorola
of Johnson trade mark Kenwood of Johnson
icom or any radio model ref or mode name trade name of icom
idas trade name or mode for icom
nxdn trade name or mode trade mark for Kenwood
p25 specific science format
DStar trade mark and mode ownership icom
Anytone trade name of ANYTONE
Looney tunes is a registered trade name
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